International Research Conference on Food, Nutrition, and Cancer

Poster Abstracts[1]

Food, Nutrition, Physical Activity, and Endometrial Cancer: a Comparison of Two Systematic Literature Reviews as a Test of WCRF International's New Methodology. L. M. Miles,* E. V. Bandera,† V. Burley, R. R. Butrum,‡ J. Cade,†† G. J. Cannon,* D. Forman,†† J. L. Freudenheim,‡‡ I. Gordon,†† D. Greenwood,†† S. J. Heggie,* D. R. Jacobs, Jr.,# C. A. James,‡ R. Kalliecharian,†† L. H. Kushi,§ M. L. McCullough,## J. Moreton,†† T. Rastogi,§§ E. M. Stone,* R. L. Thompson,*** and M. J. Wiseman.*** *World Cancer Research Fund International, London, UK; †Cancer Institute of New Jersey, UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ; **Nuffield Institute of Health, University of Leeds, Leeds, UK; ‡American Institute for Cancer Research, Washington DC; ††School of Medicine, University of Leeds, Leeds, UK; ‡‡Department of Social and Preventive Medicine, University of Buffalo School of Medicine, State University of New York, Buffalo, NY; #Division of Epidemiology, University of Minnesota School of Public Health, Minneapolis, MN; §Division of Research, Kaiser Permanente, Oakland, CA; ##Epidemiology and Surveillance Research, American Cancer Society, Atlanta, GA; §§Division of Cancer Epidemiology and Genetics, National Cancer Institute, Rockville, MD; and ***Institute of Human Nutrition, University of Southampton, UK.

The World Cancer Research Fund (WCRF) and American Institute for Cancer Research (AICR) are producing a second expert report to follow the landmark 1997 report Food, Nutrition and the Prevention of Cancer: a global perspective. A task force was convened to guide the development of a standardized methodology for reviewing the literature on etiology of cancer in terms of food, nutrition, and physical activity. The outcome was presented as a set of guidelines for conducting systematic literature reviews. The new methodology has been tested by 2 independent centers, one in the United States, based at Kaiser Permanente, and another in the United Kingdom, based at the University of Leeds. Each center conducted independent systematic literature reviews on the associations between food, nutrition, physical activity, and the risk of endometrial cancer using the standardized methodology. The output was assessed by a comparison of the search results, assignment of study design, and assignments of key papers and meta-analyses in order to determine a measure of reproducibility. In addition, the test was used to assess the feasibility and utility of the new methodology. The 2 centers identified a combined total of 303 relevant epidemiological papers. Of these, 157 papers were identified as relevant by both centers. The discrepancies in the identification of relevant papers were a result of differences in search results and assessment of relevance, each contributing equally to the discrepancies. The 2 centers identified a combined total of 138 key papers. Of the total papers included, only 7% were identified as key papers by one center and missed by the other. For exposures where a meta-analysis was conducted, summary estimates were similar. No effect size estimate (as odds ratio or risk ratio) from one test center fell outside the 95% confidence intervals of the other.

Dietary Lipids and Endometrial Cancer Risk: Systematic Literature Reviews and Meta-analyses. L. H. Kushi,* E. V. Bandera,† D. F. Moore, V. Burley,‡ J. Cade,‡ D. Forman,‡ J. L. Freudenheim,†† D. C. Greenwood,‡‡ D. R. Jacobs, Jr.,# M. L. McCullough,§ and T. Rastogi.## ***Division of Research, Kaiser Permanente, Oakland, CA; †Cancer Prevention and Control Program, The Cancer Institute of New Jersey, New Brunswick, NJ; **Department of Biostatistics, School of Public Health, University of Medicine and Dentistry of New Jersey, Piscataway, NJ; ‡The Centre for Epidemiology and Biostatistics, University of Leeds, Leeds, UK; ††Department of Social and Preventive Medicine, University at Buffalo School of Public Health and Health Professions, State University of New York, Buffalo, NY; ‡‡Biostatistics Unit, University of Leeds Medical School, Leeds, UK; #Division of Epidemiology, University of Minnesota School of Public Health, Minneapolis, MN and Department of Nutrition, University of Oslo, Oslo, Norway; §Department of Epidemiology and Surveillance Research, American Cancer Society, Atlanta, GA; ##Division of Cancer Epidemiology and Genetics, National Cancer Institute, Rockville, MD.

In the 1997 World Cancer Research Fund and American Institute for Cancer Research report, *Food, Nutrition and the Prevention of Cancer,* it was suggested that it was "possible" that saturated and animal fat may increase endometrial cancer risk whereas evidence was deemed "insufficient" for total fat or dietary cholesterol intake. To support a new version of this report, we conducted systematic literature reviews and meta-analyses on these 4 variables and endometrial cancer risk. We identified 8 case-control and 2 cohort studies with data published in 11 peer-reviewed manuscripts that were suitable for inclusion in the meta-analyses. For total fat intake in a random-effects dose-response meta-analysis, there was a relative risk estimate (RR) of 1.09 [95% confidence interval (CI): 1.01–1.09] for an increase of 10% of energy from fat. For animal fat the summary RR was 1.10 (95% CI: 0.98–1.25) for an increase of 7 g/1000 kcal. For saturated fat a 7 g/1000 kcal

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increase resulted in a RR of 1.10 (95% CI: 0.98–1.23). For these variables, excluding cohort studies resulted in a modest increase in the pooled estimates. The substantial heterogeneity among study RRs was also diminished when analyses were limited to case-control studies. For dietary cholesterol the RR was 1.12 (95% CI: 0.98–1.28) for an increase of 150 mg/1000 kcal, with substantial unexplained heterogeneity. Meta-analyses based on comparisons of high and low intake as reported in the published manuscripts also indicated elevated RRs with higher intakes of these variables. Overall, these results confirm and extend suggestions from the 1997 report that consumption of these dietary lipids is associated with increased endometrial cancer risk. [Funded in part by grants from World Cancer Research Fund International and by K07 CA095666 to Dr. Bandera. The views expressed in this abstract are those of the authors and do not represent those of the World Cancer Research Fund International or the National Cancer Institute.]

Biomarkers

1,N^2-Propano-DNA Adduct Levels in White Blood Cells as Biomarkers for Cancer Risk as Affected by Nutritional and Lifestyle Factors in a Representative Population Sample in Bavaria, Germany: First Results. E. Eder,* P. Wanek,* D. Kratzin,* and J. Linseisen.† *Department of Toxicology, University of Wuerzburg, and †Human Nutrition and Cancer Prevention, TU Munich.

The modulation of DNA adduct levels in white blood cells as markers for cancer risk by nutritional behavior and lifestyle will be assessed in a subsample of a population-based study representative of Bavaria, Germany. The subsample comprises those aged 18–80 y for whom blood samples are available. Thus far, propano adducts of the lipid peroxidation product 4-hydoxy-2-nonenal have been measured in white blood cells of 214 of 600 persons. Red blood cell membrane fatty acids and plasma antioxidants were estimated as biomarkers of dietary intake. Descriptive data, including socioeconomic variables, were assessed by computer-assisted face-to-face interviews during recruitment. We found a significant correlation ($P = 0.001$) between the socioeconomic status (as defined by household net income, educational level, career position) and white blood cell adduct concentrations: the higher the socioeconomic status, the higher the adduct levels. Concerning fatty acids there was a significant negative correlation ($P = 0.016$) between the 20:5 (n-3) fatty acid concentration in red blood cell membranes and adduct levels; no other fatty acid was significantly associated with adduct concentrations. Another interesting effect in these preliminary data was a significant positive correlation between adduct levels and plasma vitamin C concentrations ($P = 0.007$). However, there is an inverse but nonsignificant association between plasma vitamin E concentrations and white blood cell adducts. These interesting and partly surprising preliminary results need further confirmation by including the whole study population in the analyses and measuring 8-oxodeoxyguanosine as a cancer risk marker for oxidative stress. Only then will we be able to adequately interpret the results and draw valid conclusions.

Dietary Exposure to Human Hepatocarcinogens, Aflatoxins, Micronutrient Deficiency, and Child Growth in Benin, West Africa. Y. Y. Gong,* P. C. Turner,* A. Hounsa,† K. L. White,* K. F. Cardwell, S. Egal,† A. J. Hall,‡ and C. P. Wild.*** *Molecular Epidemiology Unit, Centre for Epidemiology and Biostatistics, School of Medicine, University of Leeds, Leeds, UK; †International Institute of Tropical Agriculture, Cotonou, Benin, West Africa; **US Department of Agriculture, Washington DC; and ‡London School of Hygiene & Tropical Medicine, London, UK.

Aflatoxins are proven hepatocarcinogens and are immunosuppressive in animals. High aflatoxin exposure is common in West African countries, where micronutrient deficiency is also highly prevalent. Recent studies in Benin suggest that aflatoxin exposure impairs child growth (1). It is important to investigate whether there is combined effect of aflatoxin exposure and micronutrient deficiency on child growth. Over an 8-mo period, 200 children (aged 16–37 mo) were surveyed 3 times. Aflatoxin albumin adducts (AF-alb), a marker of aflatoxin exposure, and anthropometric parameters were measured at each survey; α-tocopherol, β-carotene, retinol, and zinc in blood were measured at the first 2 surveys. The geometric mean AF-alb level in February was 37.4 pg/mg (0.12 nmol/g) and doubled after 8 mo (October). AF-alb was detectable in >98% of blood samples and a 10-fold difference in mean level was found between villages. Weaning onto family foods was associated with an increase in aflatoxin exposure. AF-alb was strongly inversely correlated with height increase even after adjustment for confounding factors. Overall, height gain was reduced 1.67 cm between the upper and the lower quartiles of AF-alb over the 8-mo period. Vitamin A deficiency (plasma retinol level < 1.05 μmol/L) was 35% and 38% in February and June, respectively; 70% of subjects showed zinc deficiency (serum zinc < 12.6 mmol/L). No significant correlation occurred between weight or height increase and zinc, β-carotene, or retinol level. Plasma α-tocopherol level was positively related to height increase after adjustment ($P = 0.011$). No significant correlation was seen between AF-alb and any of the micronutrients investigated. This study confirmed that aflatoxin exposure, independent of micronutrient deficiency, impairs child growth after weaning. It highlights the importance of decreasing aflatoxin exposure by interventions targeted to children being weaned.

1. Gong, Y. Y., Cardwell, K., Hounsa, A., Egal, S., Turner, P. C., Hall, A. J. & Wild, C. P. (2002) Dietary aflatoxin exposure and impaired growth in young children from Benin and Togo: cross sectional study. Br. Med. J. 325: 20–21.

High Intake of Bread Is Associated with Lower Fecal Water Genotoxicity and Decreased DNA Damage in Lymphocytes of Humans—Results of a Multitissue Biomarker Approach. Nina Habermann,* Michael Glei,* Kerstin Osswald,* Christoph Persin,† Gerhard Jahreis, and Beatrice L. Pool-Zobel.*** *Department of Nutritional Toxicology, Institute for Nutrition, Friedrich Schiller University, Jena, Germany; †Kampffmeyer Food Service GmbH, Hamburg, Germany; and **Department of Nutritional Physiology, Institute for Nutrition, Friedrich Schiller University, Jena, Germany.

OBJECTIVE: Research is needed to assess exposure in humans and to improve understanding of cancer-preventive functions of diet. Biomarkers, which are specific for individual exposure routes, should be of advantage for this area of research. We have compared different biomarkers in human volunteers. METHODS: Buccal scrapings, blood, and feces were collected from male smokers (20) and nonsmokers (18) during an intervention study with bread enriched with prebiotics with or without antioxidants. Buccal leukocytes and peripheral lymphocytes were isolated by gradient centrifugation. Fecal water (FW) was prepared by ultracentrifugation and incubated with